Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. to **52.** (cancelled).

53. (new) An RF detector for use in association with a semiconductor processing system for detecting process parameters during semiconductor plasma processing, comprising:

an AC voltage transducer coupled to said RF power delivery line and associated with said semiconductor processing system for generating RF voltage sample measurements of RF voltages from said RF power delivery line as said RF voltages occur within a semiconductor plasma processing environment of said semiconductor processing system;

an AC current transducer coupled to said RF power delivery line and associated with said semiconductor processing system for generating current signals sample measurements of AC from said RF power delivery line as said current signals occur within said semiconductor plasma processing environment;

said RF detector further separating the signal output from said AC voltage transducer into a DC component and an RF component, said DC component for generating a DC voltage parameter and said RF component of the signal for generating an RF voltage parameter, and further comprising an RF current detector for generating an RF current output;

a phase detector for outputting a phase angle of the RF current output relative to the RF voltage parameter;

said RF detector formed in a single integrated unit and further comprising means for coupling to an RF power delivery line between an RF power delivery network and a plasma RF load within said semiconductor plasma processing environment.

54. (new) The RF detector of claim 1, wherein said RF detector further comprises a memory unit within said single integrated unit for storing calibration information relating to said AC voltage transducer, said AC current transducer, and said phase detector, thereby enabling said RF detector to operate as a single integrated unit.\

55. (new) The RF detector of claim 1, wherein said RF detector operates independent of the frequency of said RF power from said RF power delivery network.

56. (new) The RF detector of claim 1, further comprising circuitry for operation in association with said AC voltage transducer and said AC current transducer for determining the proper operation of an RF power delivery network by sensing operating parameters before said RF power reaches a predetermined load portion of an impedence matching circuit associated with said RF power delivery network.

57. (new) The RF detector of claim 4, wherein said predetermined load portion of an impedence matching circuit comprises a 50 ohm impedance matching circuit.

58. (new) The RF detector of claim 1, further comprising circuitry for operation in association with said AC voltage transducer and said AC current transducer for determining the proper operation of an RF power delivery network by sensing operating parameters after said RF power reaches a predetermined load portion of an impedence matching circuit.

59. (new) The RF detector of claim 1, further comprising circuitry for operation in association with said AC voltage transducer and said AC current transducer for determining the input impedance from an impedance matching network to said plasma RF load within said semiconductor plasma processing environment.

60. (new) The RF detector of claim 1, further comprising circuitry for operation in association with said AC voltage transducer and said AC current

transducer for determining power transfer efficiency from said RF power delivery network to said plasma RF load within said semiconductor plasma processing environment.

61. (new) A method for use in association with a semiconductor processing system for detecting plasma process parameters during semiconductor plasma processing, comprising:

generating RF voltage sample measurements of RF voltages from said RF power delivery line as said RF voltages occur within a semiconductor plasma processing environment of said semiconductor processing system using a AC voltage transducer coupled to said RF power delivery line and associated with said semiconductor processing system;

generating current signals sample measurements of AC from said RF power delivery line as said current signals occur within said semiconductor plasma processing environment using an AC current transducer coupled to said RF power delivery line and associated with said semiconductor plasma processing system;

separating the signal output from said AC voltage transducer into a DC component and an RF component, said DC component for generating a DC voltage parameter and said RF component of the signal for generating an RF voltage paramenter, and generating an RF current output using an RF current detector of said RF detector;

outputting a phase angle of the RF current output relative to the RF voltage parameter using a phase detector within said RF detector; and

coupling said RF detector as a single integrated unit to an RF power delivery line between an RF power delivery network and a plasma RF load within said semiconductor plasma processing environment.

62. (new) The method of claim 9, further comprising the step of storing calibration information relating to said AC voltage transducer, said AC current transducer, and said phase detector in a memory unit within said single integrated unit for, thereby enabling said RF detector to operate as a single integrated unit.

63. (new) The method of claim 9, further comprising the step of operating said RF detector independent of the frequency of said RF power from said RF power delivery network.

64. (new) The method of claim 9, further comprising the step of operating said RF detector with said AC voltage transducer and said AC current transducer for determining the proper operation of an RF power delivery network by sensing operating parameters before said RF power reaches a predetermined load portion of an impedance matching circuit associated with said RF power delivery network.

65. (new) The method of claim 12, wherein said predetermined load portion of an impedance matching circuit comprises a 50 ohm impedance matching circuit.

66. (new) The method of claim 9, further comprising determining the proper operation of an RF power delivery network by sensing operating parameters after said RF power reaches a predetermined load portion of an impedance matching circuit.

67. (new) The method of claim 9, further comprising the step of determining the input impedance from an impedance matching network to said plasma RF load within said semiconductor plasma processing environment.

68. (new) The method of claim 8, further comprising the step of determining power transfer efficiency from said RF power delivery network to said plasma RF load within said semiconductor plasma processing environment.